

Supplemental Material

**Maternal Arsenic Exposure, Arsenic Methylation Efficiency, and Birth
Outcomes in the Biomarkers of Exposure to ARsenic (BEAR) Pregnancy
Cohort in Mexico**

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Table S1. Comparisons of DW-iAs and SG-Adjusted U-tAs based on selected self-reported maternal demographic characteristics.

Characteristic	n ^a (%)	DW-iAs ($\mu\text{g}/\text{L}$) Mean, median (range)	U-tAs ($\mu\text{g}/\text{L}$) Mean, median (range)
Drinking water source			
Tap	110 (55%)	40.0, 23.3 (0.326-236.0)*	49.5, 34.0 (4.3-319.7)*
No. glasses day		4.4, 4 (1-12)	
Bottled water	90 (45%)	5.8, 0.40 (0.326-70.0)	22.9, 17.2 (4.4-153.0)
No. glasses day		4.7, 4 (1-16)	
Cooking water source			
Tap	155 (80%)	29.9, 18.1 (0.326-236.0)*	42.9, 28.1 (4.3-319.7)*
Bottled water	38 (20%)	7.0, 0.653, (0.326-37.1)	18.5, 16.2 (4.4-63.5)
Bathing water source			
Tap	197 (100%)	N/A	N/A
Bottled water	0	N/A	N/A
Seafood consumption			
Consumed	43 (22%)	N/A	35.0, 22.0 (4.3-261.4)
Not consumed	155 (78%)	N/A	47.1, 28.1 (6.0-319.7)
Age			
<25	123 (61.5%)	27.0, 14.3 (0.326-236.0)	38.1, 22.6 (4.3-319.7)
25-30	50 (25%)	16.4, 3.4 (0.326-131.9)	34.9, 22.7 (4.4-170.2)
>30	27 (13.5%)	29.0, 12.8 (0.326-189.8)	39.5, 24.3 (7.3-224.3)
Education			
<High school	50 (25.2%)	31.3, 20.5 (0.326-226.2)*	47.7, 31.6 (7.8-224.3)*
High school	95 (47.7%)	24.6, 12.8 (0.326-212.1)	37.2, 24.6 (4.3-319.7)
College	41 (20.6%)	20.7, 8.80 (0.326-236.0)	32.1, 18.8 (7.4-153.0)
>College	13 (6.5%)	13.3, 0.635 (0.326-60.0)	19.4, 15.6 (7.3-53.4)
Residence			
Rural	61 (30.5%)	15.2, 13.2 (0.326-68.7)	30.8, 24.6 (4.3-153.0)
Urban	137 (68.5%)	32.8, 12.8 (0.326-236.0)	43.4, 22.6 (4.4-319.7)

^aDifferences in n based on missing demographic data.

*Significant difference in means ($p<0.05$) between subcategories.

Table S2. Multivariable regression analyses between exposure and metabolism indicators (DW-iAs, SG-Adjusted: U-tAs, U-iAs, U-MMAs, U-DMAs, %iAs, %MMAs, and %DMAs) and birth outcomes/measures.

Characteristic	DW-iAs β (p-value) [CI]	U-tAs β (p-value) [CI]	U-iAs β (p-value) [CI]	U-MMAs β (p-value) [CI]	U-DMAs β (p-value) [CI]	%iAs β (p-value) [CI]	%MMAs β (p-value) [CI]	%DMAs β (p-value) [CI]
Gestational age (wks)								
<i>Unadjusted</i>								
β (p-value)	-0.0025 (0.2280)	-0.0029 (0.1499)	-0.056 (0.0949)	-0.054 (0.0741)	-0.0030 (0.1749)	0.0032 (0.8851)	-0.036 (0.2061)	0.0078 (0.5778)
[CI]	[-0.0065, 0.0061]	[-0.0068, 0.0010]	[-0.12, 0.0097]	[-0.11, 0.0052]	[-0.0074, 0.0013]	[-0.040, 0.047]	[-0.093, 0.0200]	[-0.020, 0.035]
<i>Model I^a</i>								
β (p-value)	-0.0032 (0.1233)	-0.0036 (0.0724)	-0.069 (0.0367)*	-0.067 (0.0233)*	-0.0037 (0.0913)	-0.0006 (0.9792)	-0.043 (0.1282)	0.011 (0.4423)
[CI]	[-0.0072, 0.0009]	[-0.0075, 0.003]	[-0.13, -0.0043]	[-0.13, -0.0092]	[-0.0081, 0.0006]	[-0.043, 0.042]	[-0.098, 0.012]	[-0.017, 0.38]
<i>Model III^b</i>								
β (p-value)	-0.0040 (0.1177)	-0.0067 (0.0830)	-0.090 (0.0137)*	-0.088 (0.0103)*	-0.0075 (0.0980)	0.0007 (0.9775)	-0.0393 (0.2178)	0.0087 (0.5689)
[CI]	[-0.0091, 0.0010]	[-0.0117, 0.0017]	[-0.16, -0.019]	[-0.15, -0.021)	[-0.013, 0.0018]	[-0.045, 0.046]	[-0.10, 0.023]	[-0.021, 0.039]
Birth weight (g)								
<i>Unadjusted</i>								
β (p-value)	0.066 (0.93)	-0.35 (0.6537)	-18.1 (0.1616)	-18.6 (0.1098)	-0.25 (0.7730)	-7.9 (0.3547)	-23.8 (0.0303)	9.3 (0.0852)
[CI]	[-1.5, 1.6]	[-1.9, 1.2]	[-43.4, 7.2]	[-41.3, 4.2]	[-1.9, 1.4]	[-24.6, 8.8]	[-45.4, -2.3]	[-1.3, 19.9]
<i>Model I^a</i>								
β (p-value)	-0.1 (0.8956)	-0.58 (0.4489)	-21.7 (0.0901)	-24.4 (0.0325)*	-0.49 (0.5674)	-6.4 (0.4424)	-24.5 (0.0226)*	8.9 (0.0928)
[CI]	[-1.7, 1.4]	[-2.1, 0.93]	[-46.8, 3.4]	[-46.8, -2.0]	[-2.2, 1.2]	[-22.9, 10.0]	[-45.6, -3.4]	[-1.5, 19.3]
<i>Model II^c</i>								
β (p-value)	0.19 (0.8031)	-0.0260 (0.9721)	-10.3 (0.4094)	-14.9 (0.1802)	0.038 (0.9642)	-6.1 (0.4453)	-18.1 (0.0848)	7.7 (0.1307)
[CI]	[-1.3, -1.7]	[-1.5, 1.4]	[-34.8, 14.2]	[-36.7, 6.9]	[-1.6, 1.7]	[-21.6, 9.5]	[-38.7, 2.5]	[-2.3, 17.8]
<i>Model III^b</i>								
β (p-value)	-0.25 (0.8025)	-0.84 (0.3994)	-19.5 (0.1704)	-23.7 (0.0731)	-0.79 (0.4859)	-4.8 (0.5913)	-23.1 (0.0569)	7.4 (0.2023)
[CI]	[-2.20, 1.70]	[-2.79, 1.11]	[-47.3, 8.4]	[-49.7, 2.2]	[-3.0, 1.4]	[-22.3, 12.7]	[-46.8, 0.68]	[-4.0, 18.8]
Newborn length (cm)								
<i>Unadjusted</i>								
β (p-value)	-0.0051 (0.2659)	-0.0053 (0.2270)	-0.16 (0.0257)*	-0.098 (0.1399)	-0.0054 (0.2747)	-0.059 (0.2260)	-0.071 (0.2631)	-0.0054 (0.2747)
[CI]	[-0.014, 0.0039]	[-0.014, 0.0033]	[-0.31, -0.020]	[-0.23, 0.032]	[-0.015, 0.0043]	[-0.15, 0.036]	[-0.19, 0.053]	[-0.015, 0.0043]
<i>Model I^a</i>								
β (p-value)	-0.0051 (0.2629)	-0.0055 (0.2204)	-0.16 (0.0265)*	-0.11 (0.0898)	-0.0054 (0.2732)	-0.054 (0.2642)	-0.082 (0.1908)	0.041 (0.1796)
[CI]	[-0.014, 0.0038]	[-0.014, 0.0033]	[-0.31, 0.019]	[-0.24, 0.018]	[-0.015, 0.0043]	[-0.15, 0.041]	[-0.21, 0.041]	[-0.020, 0.10]

Characteristic	DW-iAs β (p-value) [CI]	U-tAs β (p-value) [CI]	U-iAs β (p-value) [CI]	U-MMAs β (p-value) [CI]	U-DMAs β (p-value) [CI]	%iAs β (p-value) [CI]	%MMAs β (p-value) [CI]	%DMAs β (p-value) [CI]
<i>Model II^c</i>								
β (p-value)	-0.0033 (0.4455)	-0.0019 (0.6581)	-0.091 (0.2033)	-0.049 (0.4413)	-0.0017 (0.7204)	-0.052 (0.2539)	-0.050 (0.4046)	0.032 (0.2686)
[CI]	[-0.018, 0.0052]	[-0.010, 0.0064]	[-0.23, 0.049]	[-0.17, 0.076]	[-0.011, 0.0075]	[-0.14, 0.037]	[-0.17, 0.067]	[-0.025, 0.089]
<i>Model III^b</i>								
β (p-value)	-0.0034 (0.5162)	-0.0076 (0.1467)	-0.1745 (0.1890)	-0.1427 (0.4120)	-0.0077 (0.1973)	-0.0438 (0.3535)	-0.0863 (0.1815)	0.0390 (0.2048)
[CI]	[-0.014, 0.0069]	[-0.018, 0.0027]	[-0.32, 0.029]	[-0.2796, 0.0057]	[-0.019, 0.0040]	[-0.14, 0.049]	[-0.21, 0.040]	[-0.021, 0.099]
Head circumference (cm)								
<i>Unadjusted</i>								
β (p-value)	-0.0020 (0.4479)	-0.0017 (0.5277)	-0.054 (0.2397)	-0.052 (0.1876)	-0.0015 (0.5976)	0.0051 (0.8572)	-0.029 (0.4336)	0.0044 (0.8062)
[CI]	[-0.0072, 0.0032]	[-0.0069, 0.0035]	[-0.14, 0.036]	[-0.13, 0.026]	[-0.0073, 0.0042]	[-0.050, 0.060]	[-0.10, 0.0432]	[-0.031, 0.040]
<i>Model I^a</i>								
β (p-value)	-0.0026 (0.3329)	-0.0022 (0.3959)	-0.061 (0.1864)	-0.067 (0.0907)	-0.0021 (0.4646)	0.01 (0.7129)	-0.03 (0.4129)	0.0025 (0.8892)
[CI]	[-0.0077, 0.0026]	[-0.0074, 0.0029]	[-0.15, 0.030]	[-0.14, 0.011]	[-0.0079, 0.0036]	[-0.044, 0.065]	[-0.10, 0.041]	[-0.032, 0.037]
<i>Model II^c</i>								
β (p-value)	-0.0021 (0.4232)	-0.0019 (0.4590)	-0.058 (0.2047)	-0.060 (0.1228)	-0.0018 (0.5315)	0.0090 (0.7446)	-0.023 (0.5308)	0.0012 (0.9438)
[CI]	[-0.0073, 0.0030]	[-0.0071, 0.0032]	[-0.15, 0.032]	[-0.14, 0.0163]	[-0.0075, 0.0039]	[-0.045, 0.063]	[-0.094, 0.048]	[-0.033, 0.036]
<i>Model III^b</i>								
β (p-value)	-0.0016 (0.6331)	-0.0004 (0.9154)	-0.0418 (0.4177)	-0.0344 (0.4583)	.000001 (0.9978)	0.099 (0.7388)	-0.0122 (0.7642)	-0.0034 (0.8588)
[CI]	[-0.0081, 0.0050]	[-0.0072, 0.0065]	[-0.14, 0.059]	[-0.13, 0.056]	[-0.0077, 0.0077]	[-0.048, 0.068]	[-0.092, 0.068]	[-0.041, 0.035]
Placental weight (g)								
<i>Unadjusted</i>								
β (p-value)	0.15 (0.5105)	0.43 (0.1529)	0.99 (0.8023)	-0.18 (0.9571)	0.39 (0.1164)	-3.4 (0.1618)	-9.3 (0.0027)*	3.5 (0.0232)*
[CI]	[-0.30, 0.60]	[-0.12, 0.77]	[-6.8, 8.8]	[-6.9, 6.6]	[-0.098, 0.89]	[-8.1, 1.4)	[-15.4, -3.2]	[0.47, 6.5]
<i>Model I^a</i>								
β (p-value)	0.12 (0.5892)	0.31 (0.1736)	0.73 (0.8544)	-1.3 (0.7101)	0.38 (0.128)	-3.2 (0.1889)	-9.8 (0.0015)*	3.5 (0.021)*
[CI]	[-0.32, 0.57]	[-0.14, 0.76]	[-7.1, 8.5]	(-8.0, 5.5)	[-0.11, 0.88]	[-7.9, 1.6]	[-15.8, -3.8]	[0.53, 6.5]
<i>Model II^c</i>								
β (p-value)	0.12 (0.5888)	0.31 (0.1790)	0.53 (0.8936)	-1.3 (0.7040)	0.38 (0.1319)	-3.2 (0.1823)	-9.7 (0.0017)*	3.5 (0.0223)*
[CI]	[-0.33, 0.57]	(-0.14, 0.75)	[-7.3, 8.3]	[-8.0, 5.4]	[-0.11, 0.87]	[-7.9, 1.5]	[-15.7, -3.7]	[0.49, 6.4]
<i>Model III^b</i>								
β (p-value)	0.13 (0.6533)	0.38 (0.1952)	0.68 (0.5355)	-1.4 (0.7111)	0.47 (0.1478)	-1.5 (0.5501)	-9.5 (0.0045)*	2.6 (0.1066)
[CI]	[-0.42, 0.68]	[-0.19, 0.95]	[-5.8, 11.2]	[-9.08, 6.19]	[-0.17, 1.1]	[-6.4, 3.4]	[-16.0, -2.9]	[-0.56, 5.8]

Characteristic	DW-iAs β (p-value) [CI]	U-tAs β (p-value) [CI]	U-iAs β (p-value) [CI]	U-MMAs β (p-value) [CI]	U-DMAs β (p-value) [CI]	%iAs β (p-value) [CI]	%MMAs β (p-value) [CI]	%DMAs β (p-value) [CI]
APGAR score								
<i>Unadjusted</i>								
β (p-value)	0 (0.9812)	0 (0.9013)	-0.011 (0.7989)	-0.00010 (0.9704)	0 (0.8758)	0 (0.9948)	0.0008 (0.8186)	-0.0002 (0.9133)
[CI]	[-0.005, 0.005]	[-0.0005, 0.0004]	[-0.0095, 0.0073]	[-0.0074, 0.0072]	[-0.0005, 0.0006]	[-0.0052, 0.0051]	[-0.0059, 0.0075]	[-0.0035, 0.0031]
<i>Model I^a</i>								
β (p-value)	0 (0.9873)	0 (0.8519)	-0.0013 (0.7689)	0.0004 (0.9164)	0.0001 (0.8274)	-0.0002 (0.9298)	0.011 (0.7399)	-0.0001 (0.9372)
[CI]	[-0.0005, 0.0005]	[-0.0004, 0.0005]	[-0.0097, 0.0072]	[-0.0069, 0.0070]	[-0.0005, 0.0006]	[-0.0054, 0.0049]	[-0.0056, 0.0078]	[-0.0034, 0.003]
<i>Model II^c</i>								
β (p-value)	0 (0.9806)	0 (0.8825)	-0.0015 (0.7263)	0.0003 (0.9432)	0 (0.8564)	-0.0003 (0.9227)	0.0003 (0.9432)	-0.0001 (0.9282)
[CI]	[-0.005, 0.005]	[-0.0004, 0.0005]	[-0.010, 0.0070]	[-0.0070, 0.0076]	[-0.0005, 0.0006]	[-0.0054, 0.0049]	[-0.0070, 0.0076]	[-0.0034, 0.0031]
<i>Model III^b</i>								
β (p-value)	0 (0.9889)	0.0001 (0.8370)	-0.0018 (0.7364)	0.0005 (0.9227)	0.0001 (0.8024)	-0.0004 (0.9086)	0.0012 (0.7707)	-0.0001 (0.9725)
[CI]	[-0.0007, 0.0007]	[-0.0006, 0.0008]	[-0.012, 0.0087]	[-0.0090, 0.0099]	[-0.0007, 0.0009]	[-0.0064, 0.0057]	[-0.0071, 0.0095]	[-0.0040, 0.0039]

*Association (p<0.05) between birth outcomes and arsenic exposure indicators.

^aModel I was adjusted for the following covariates: maternal age, education, smoking, and alcohol consumption. ^bModel III sensitivity analysis analyzed using non-seafood consumers (n=155), adjusted for the following covariates: maternal age, education, smoking, and alcohol consumption.

^cModel II was adjusted for the following covariates: gestational age, maternal age, education, smoking, and alcohol consumption.

Supplemental Material, Figure S1

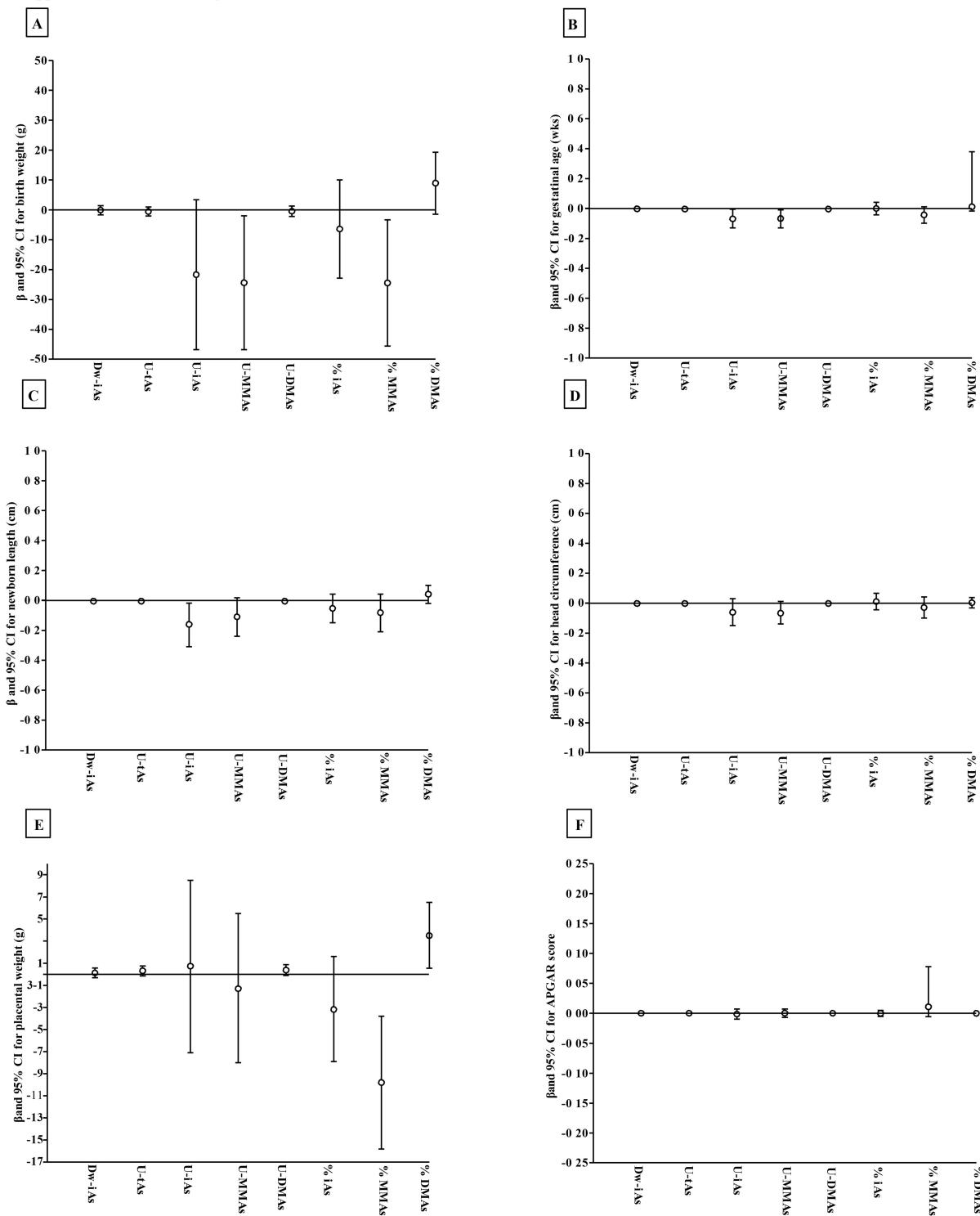


Figure S1. Multivariable regression analyses relating maternal iAs exposure and metabolism indicators and birth outcomes/measures. (A) birth weight, (B) gestational age, (C) newborn length, (D) head circumference, (E) placental weight, and (F) APGAR score. β estimates and confidence intervals are displayed.